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Jane Dee Hull, Governor
James R. Allen, MD, MPH, Director

DATE: March 16, 1998

TO: Laboratory Director and QA Manager

FROM: Dr. Barbara J. Erickson, Ph.D., Bureau Chief

SUBJECT: Information Update #44

IMPORTANT: This update contains dated information regarding the upcoming ELAC meeting and a round table discussion of Method 8000B from SW-846 Update III.

NOTE: If any problems occur with this web site, please call 1-800-952-0074 or (602) 255-3454 and ask for Technical Resources and Training. Thank You.

1. The training office is organizing a round table discussion on EPA method 8000B "Determinative Chromatographic Separations" on March 27th between 1 - 4 pm. This method was recently promulgated as part of SW-846 Update III. This is being held at the Arizona State Hospital (ASH) premises, 2500 E. Van Buren, at the Training & Education building, Rooms 4 & 5 (tel. 220-6049). Enter ASH at Van Buren and go north through the guard gate and at the intersection make a left. The Training & Education building is to the right on "C" street between 1st and 3rd streets. The building has a sign which reads "Speciality Clinic, Class Rooms, Medical Library". There is plenty of parking available. Please call Cristy Finan @ (602) 255-3454 for registration.

2. **Correction to Update #41, item #2 on 8015AZ:**
   Arizona Department of Environmental Quality (ADEQ) will accept only 418.1AZ through March 31, 1998 for the compliance testing of petroleum hydrocarbons in soil. After March 31, 1998, beginning April 01, 1998, ADEQ will accept only 8015AZ for compliance testing of petroleum hydrocarbons in soil.

3. **Microbiology collection bottles sterility failure:**

   Manual for the Certification of Laboratories Analyzing Drinking Water, fourth edition, chapter V, section 4.2.2, details a procedure to perform a random sterility check on micro sample containers. The Arizona Laboratory Licensure accepts the sterility certifications from the vendors and does not require this sterility check to be performed by the laboratories.

   Some laboratories play it safe and choose to perform this sterility test procedure on collection bottles. The data collected from these laboratories who perform random sterility checks, the following lot numbers of Corning sterile 4 oz collection bottles, showed growth in 25 ml sterile non-selective broth

upon incubation at 35 ± 0.50 C.

Lot #s: CO-081796, 090796, 051797.

Be aware of this problem if you use sample containers with these lot numbers.

4. **The requirements for the evaluation of interelement spectral interferences.** (We would like to thank Mr. Ted Martin, EPA Cincinnati, for his assistance.)

   The interference effects must be evaluated for each individual instrument whether configured as a sequential or simultaneous instrument. This must be repeated whenever instrument conditions change such as in the torch, nebulizer, injector or plasma. Spectral overlaps may be avoided by using an alternate wavelength which is free of spectral interference or can be compensated for by equations that correct for interelement contributions. When interelement corrections are applied, there is a need to verify their accuracy by analyzing individual Spectral Interference Check (SIC) solutions, daily or weekly. Following is an outline for the ICP spectral interference check routine. Please refer to individual methods for more details.

   EPA 200.7, Rev. 4.4, May 1994.

   a. Preparation of single element SIC solutions of interfering elements to determine if the spectral overlaps exist.

      i. Prepare single analyte solutions of each interfering element at 100 mg/L or upper LDR. The interfering element should be spiked at a high enough level to cover the interferences for the whole range of matrices normally analyzed.

      ii. Table 2, shows interfering elements normally seen at the wavelengths suggested in Table 1.

   b. Analyze the individual SIC solutions prepared above and determine the presence of the possible interferences.

      i. A presence of positive or negative concentration of the analyte of interest that is outside the upper or lower control limits of the calibration blank is considered an interelement spectral interference (10.4). The upper and lower control limits are determined by running 10 consecutive calibration blanks on a single day (this can be repeated over several days) then calculating 3 Standard Deviation (SD) using data from all the days' runs. The upper limit is the laboratorys' IDL.

   c. If no interferences are found for all the analytes of interest, this interference check study needs to be performed annually.

   d. If only finished drinking waters are analyzed and if they are known not to contain interfering elements >= 10 mg/L, this interference check study need only be done annually.

   e. If positive or negative interferences are found, the frequency of the verification of the correction factors is determined as follows:

i. If multiplying the correction factor by 10, yields a number that is outside of the upper or lower control limits of the calibration blank (as calculated in section b.i.), then the correction factors for those interfering elements need to be checked daily. For iron and aluminum multiply the correction factors by 100.

f. Protocol for the verification of the correction factors.

i. Run applicable individual SIC solutions at concentrations listed in section 7.13.1 if the wavelengths from Table 1 are used. For alternate wavelengths, consult vendors or appropriate references (section 16.0).

ii. Multiply 50 (or the appropriate concentration of the individual SIC solution) by the correction factor and divide by 10, to yield a value "x". Run individual 50 mg/L (or appropriate concentration) SIC solution to determine the apparent concentration of the element of interest and subtract the calibration blank value. If the resulting number you get is outside of (+ "x") and (- "x"), then a shift of more than 10% of the correction factor has occurred. Determine the cause for the shift and update the correction factor.

iii. If on 5 consecutive days, the correction factors do not change by more than 10% (as calculate per section f.ii), then the correction factors need only be checked weekly.

iv. If your instrument does not read negative numbers, fortify 1 mg/L of the analyte of interest (which had a reading of zero) to 50 mg/L of interfering element. Determine if the resulting concentration is below 0.95 mg/L (5%) and if so, update the correction factor.

g. For instruments with no correction routine or if you do not want to use the correction factors, do the following: If the interfering elements are present at ³10 mg/L in the sample, run individual applicable SIC solutions at the concentrations determined in the sample matrix (7.14). If the resulting interference is ³10% of the concentration of analyte of interest, the analyte must be tested using either an alternate wavelength free of interferences or by another approved method.

h. If your instrument manufacturer claims their technology is not subject to spectral interferences and they claim that the spectral interference check is not required to be performed, contact the EPA for written verification and written approval.

EPA 6010B

a. All the criteria for 200.7 are applicable to this method with the following exceptions:

i. Interelement corrections need to be verified semiannually (section 3.1.9).

ii. Sections f.ii; f.iv & g, can be within 20% (3.1.9).

iii. 6010B requires that sequential instruments be verified of the absence of spectral interference by scanning over a range of 0.5 nm centered on the wavelength of interest for several samples (3.1.7).

Calculation of correction factors

This is for your information only. Most of the ICP instruments will do the correction routine automatically, if the applicable values are entered.

i. The correction factor applied to the samples is the concentration of the apparent trace analyte divided by the interfering element concentration (of the single analyte solution).

ii. The Correction Routine, applied on each sample, requires that the correction factor be multiplied by the concentration of the interfering element and the adjustments be made to the concentration of analyte of concern (see 6010B, section 3.1.4 for an example).

iii. Therefore, in order to apply a correction factor, the instrument requires that interfering elements be determined along with the trace analytes for each sample.

5. The next quarterly ELAC (Environmental Laboratory Advisory Committee) meeting will be held in Casa Grande on April 23, 1998. ELAC is an advisory committee to the Director of the Arizona Department of Health Services. It consists of members representing a variety of environmental disciplines and the members are selected by the Director. The ELAC committee advises the Director regarding the adoption of the Laboratory Licensure Rules and other issues affecting environmental testing laboratories. The quarterly meetings are free and are open to the public. If you are interested in attending, please call Lorraine Burridge @ (602) 255-3454 for registration.

6. If you have any questions regarding the Updates, or if you have any technical questions that need clarification, please call or send e-mail to Prabha Acharya, Program Manager, Technical Resources and Training at the Laboratory Licensure. A table of contents to all the Information Updates published is also available.